Marine Fisheries Initiative Program

(MARFIN)

2002 ANNUAL REPORT

January 1 to December 31, 2002

Prepared By:

Ellie F. Roche
and
Jeffrey E. Brown

State/Federal Liaison Office
National Marine Fisheries Service
9721 Executive Center Drive, North
Southeast Regional Office
St. Petersburg, Florida 33702
(727) 570-5324

March 2003

TABLE OF CONTENTS

PREFACE

The Marine Fisheries Initiative (MARFIN) promotes and endorses programs which seek to optimize economic and social benefits from marine fishery resources through cooperative efforts that evoke the best research and management talents of the Southeast Region. Preference is given to cooperative planning efforts with up to 3-year time horizons. The intent is to focus projects funded by MARFIN into cooperative efforts that provide clear answers for fishery needs covered by the NMFS Strategic Plan[1]. Goals one, two and four are particularly important. For example, a geographically restricted age and growth study of a local fishery resource is of limited value unless it is coordinated with, or verified by, similar studies which span the range of the resource. The value of such studies is also relatively limited unless the results can be combined with other studies to provide a regional assessment of the resource. MARFIN provides this necessary programmatic integration through cooperative planning, accomplishment of program activities and an annual MARFIN Conference.

The MARFIN program was created to bring together scientific, technical, industry, resource conservation, and management talents to conduct cooperative programs to facilitate and enhance the management of the marine fishery resources of the Gulf of Mexico and South Atlantic. MARFIN requires the timely dissemination of the results of both successful and unsuccessful efforts; therefore, each recipient of funding under this program is obligated to attend a MARFIN conference to report project findings. The bycatch issue remains a focal point of research needs for the Southeast Region. Critical reef fish fisheries are also being addressed, from efforts to reduce catches associated with shrimp trawls, to life history studies, as well as fishery-dependent and independent characterization work. Delineation of king mackerel stocks continues to be an area of important research effort toward mitigating management of this commercially and recreationally vital fishery. The MARFIN program also continues to diversify its research base and show its ability to respond to critical current fisheries issues by funding studies characterizing shark fisheries and providing basic biological information for responsible management of various shark species. Research on economic and sociological impacts of fisheries regulations illustrates the recognition by the MARFIN program that all aspects of a fishery must be understood to provide adequate fisheries management.

---

[1]NMFS Strategic Plan Goals:

- Rebuild overfished marine fisheries;
- Maintain currently productive fisheries;
- Advance fishery forecasts and ecosystem models;
- Integrate conservation of protected species and fisheries management;
- Improve seafood safety;
- Protect living marine resource habitat;
- Improve the effectiveness of international fisheries relationships; and
- Reduce impediment to U.S. aquaculture.

HISTORY OF THE MARFIN PROGRAM

The MARFIN Program received its initial impetus from a 1983 discussion paper entitled: "Research Needs For Information Leading To Full and Wise Use of Fishery Resources In The Gulf of Mexico," by Dr. Thomas D. McIlwain of the Gulf Coast Research Laboratory while he was in the office of then Representative Trent Lott[1]. This paper, sometimes referred to as the Lott-McIlwain paper, proposed an additional investment in fisheries research and development in the Gulf of Mexico to increase the economic contribution of marine fisheries, develop more valuable products from existing fisheries, develop export markets, forecast variation in yields and conserve and maintain presently exploited resources.

The next step in the evolution of MARFIN was the preparation and publication of the Marine Fisheries Initiative - Gulf of Mexico Phase[2]. This publication, developed by a joint industry, federal, state and academic task force, detailed the research and development efforts necessary to enhance, restore and maintain fisheries in the Gulf of Mexico. The program focused on funding projects which had the greatest probability of maintaining and improving existing fisheries, increasing revenues for the domestic industry, increasing yields from fisheries and generating increased recreational opportunity and harvest potential. Projects were to be selected for funding on their likelihood of achieving these benefits through both short-term and long-term research with consideration of the magnitude of the eventual benefit that might be realized. Both short-term projects yielding immediate benefits and long-term projects were to receive high-priority emphasis. Planning emphasis was placed upon attaining priority goals either through a single project or a series of projects necessary to attain that goal.

In 1992, the MARFIN program was expanded to include a South Atlantic component (North Carolina, South Carolina, Georgia and the Atlantic coast of Florida). The goals and objectives of the South Atlantic Phase of MARFIN are described in Special Report No. 13 of the Atlantic States Marine Fisheries Commission, Marine Fisheries Initiative (MARFIN) South Atlantic Phase[3].

The Lott-McIlwain paper and the Marine Fisheries Initiative publication were instrumental in gaining public support for the MARFIN program. On December 4, 1985, the conference report of the House and Senate that appropriated funds for the Departments of Commerce, Justice, State, the judiciary and related agencies for the fiscal year (FY) ending September 30, 1986, allocated $2,850,000 for the MARFIN Program.

The following list represents funding for each year from the start of the MARFIN program until the current year:

* Fiscal Year 1986 - $2,850,000

* Fiscal Year 1987 - $3,500,000

* Fiscal Year 1988 - $3,500,000

* Fiscal Year 1989 - $3,000,000

* Fiscal Year 1990 - $3,000,000

* Fiscal Year 1991 - $2,986,000

* Fiscal Year 1992 - $4,000,000 (This includes $500,000 of the South Atlantic MARFIN and $1,300,000 for shrimp trawl bycatch studies.)

* Fiscal Year 1993 - $3,540,000

* Fiscal Year 1994 - $3,542,000

* Fiscal Year 1995 - $3,540,000

* Fiscal Year 1996 - $2,760,000 (No new projects were accepted during FY 1996 due to a reduction in congressional allocation, and because of the large number of active multi-year projects selected during previous funding cycles.)

* Fiscal Year 1997 - $3,000,000

* Fiscal Year 1998 - $3,000,000

* Fiscal Year 1999 - $3,000,000 (This includes $500,000 for the Northeast Region.)

* Fiscal Year 2000 - $2,750,000 (No new projects were accepted during FY 2000 due to a reduction in congressional allocation, and because of the large number of active multi-year projects selected during previous funding cycles.)

* Fiscal Year 2001 - $3,500,000 (This includes $250,000 for the Northeast Region and $750,000 for red snapper research.)

* Fiscal Year 2002 - $3,500,000 (This includes $250,000 for the Northeast Region and $750,000 for red snapper research.)

MARFIN promotes and endorses programs which seek to optimize economic and social benefits from marine fishery resources through cooperative efforts that evoke the best research and management talents of the Southeast Region. The intent of the MARFIN program is to focus projects on key fisheries' issues in the southeast United States.

[1]Office of Representative Trent Lott, Washington, DC; Dr. Thomas D. McIlwain; May 1983

[2]Gulf States Marine Fisheries Commission, P.O. Box 426, Ocean Springs, MS 39564; J.Y. Christman, D.J. Etzold, T.D. McIlwain, L.B.Simpson, Eds. January 1985

[3]Special Report No, 13 of the Atlantic States Marine Fisheries Commission; E.J. Joseph, V.G. Burrell, D.M. Cupka, P.J. Eldridge, August 1988

MARFIN PROGRAM ORGANIZATION AND ADMINISTRATION

The NMFS Southeast Regional Director reformed the MARFIN Panel in FY 1992 when the program was expanded to cover the South Atlantic (Appendix 1). Each member of the MARFIN Panel provides individual recommendations to the Regional Director on MARFIN priorities and financial assistance applications. The MARFIN Panel membership is as follows:

- One state marine conservation agency representative each, from the Gulf of Mexico and the South Atlantic areas.
- One representative each from the Gulf of Mexico and the South Atlantic commercial fishing industries.
- The Executive Directors of the Gulf of Mexico and South Atlantic Fishery Management Councils.
- The Executive Directors of the Gulf and Atlantic States Marine Fisheries Commissions.
- One representative each from the Gulf of Mexico and the South Atlantic recreational fishing industries.
- One representative each from the Gulf of Mexico and the South Atlantic Sea Grant Universities.
- A NMFS Southeast Fisheries Science Center Technical representative.
- The NMFS Southeast Region Program Officer acts as an advisor to the Regional Director and MARFIN Panel members concerning Federal, Department of Commerce and NOAA financial assistance administration requirements.

Alternate representatives to the MARFIN Panel serve when necessary. Individual Panel members are appointed by the NMFS Southeast Regional Director for staggered terms.

The Regional Director of the NMFS Southeast Regional Office (SERO) relies on recommendations from individual members of the MARFIN Panel, the MARFIN Scientific Panel, and the Regional Program Office in selecting each year's projects.

Each year the MARFIN Panel and NMFS administrators and scientists identify areas of emphasis for the next year's competitive financial assistance program. These areas of emphasis are published in the Federal Register for public comment. After public review and comment, an announcement of funding availability through the competitive MARFIN financial assistance program is published as a solicitation in the Federal Register.

The NMFS Southeast Regional State/Federal Liaison Office staff is responsible for the overall administration of all NMFS Southeast grants and cooperative agreement programs, including MARFIN (Appendix 2). Their responsibilities include planning, application and selection, negotiation, performance, monitoring and close-out of all assigned competitive and noncompetitive financial assistance programs. A NMFS Southeast Regional scientific or

technical expert is assigned as the Technical Monitor for each MARFIN project. The Technical Monitor is responsible to the State/Federal Liaison Office Program Officer for all technical and cooperative aspects of assigned projects (Appendix 3). The NOAA Grants Officer is responsible for the overall administration of each NMFS financial assistance award issued to recipients outside of the Federal government and cooperates with the NMFS Southeast Region State/Federal Liaison Office in administering each financial assistance award.

- The Fourteenth Annual MARFIN Conference was held in Biloxi, Mississippi on December 10-11, 2002.

- Ecological factors limiting density and regulating growth and condition for gag grouper are being determined.

- Examination of factors resulting in release mortality of undersized red grouper, gag, red snapper and vermillion snapper are to be evaluated. Factors include depth caught and gear used.

- Movement patterns and spawning habitat of red hind grouper are being studied in a newly established Marine Fishery Reserve in the U.S. Virgin Islands.

- The biology of red snapper is being investigated by focusing on stock determination using otolith microchemistry and genetics.

- Technology transfer of new turtle excluder device modifications and updated bycatch reduction device information to the southeastern shrimp fishery.

- Demographics, density, and seasonal movement patterns of reef fish in the northeastern Gulf of Mexico associated with marine reserves.

- The effectiveness of Marine Reserve in restoring coastal food webs is being tested using the Special Protection Areas and an Ecological Reserve in the Florida Keys National Marine Sanctuary.

- Genetic analysis of wahoo, *Acanthocybium solandri*, stock structure in the western Atlantic and Gulf of Mexico is being conducted using nuclear and mitochondrial DNA markers.

- GIS analysis of fishery-dependent data in relation to definition of essential fish habitat, habitat areas of particular concern, and marine protected areas in the South Atlantic Bight.

Overview of Ongoing Research Projects

The following project description provides the title and objectives/goals of ongoing research funded through the MARFIN Program in the Southeast Region:

A. Bycatch

1. Shrimp trawl fisheries

a. "Enhancing industry contributions towards documentation of fishing effort and bycatch reduction in the shrimp fishery in the southeastern United States" - a one year, $535,095 project to field test ten promising industry bycatch reduction devices (BRD). The testing will include underwater hydrodynamic performance tests, prototype BRD construction and tuning, and actual field certification testing aboard commercial shrimp trawls fishing within U.S. federal waters. **MARFIN Award NA17FF2009**

b. "Genetic impacts of shrimp trawling on Gulf red snapper" - a one year, $68,825 project that will assay allelic variations at 20 nuclear-encoded microsatellites from samples taken during shrimp trawling and representing five subregions in the northern Gulf of Mexico, determine whether juveniles taken as bycatch represent random samples of genotypes within each subregion, and determine whether red snapper assemblages in the five subregional localities are increasing or decreasing in effective population size. **MARFIN Award NA17FF2014**

c. "Behavior and swimming performance of red snapper, *Lutjanus campechanus*: Its application to bycatch reduction"- the first year of a three year, $212,997 project to consider the effects of size, season, and time of day on red snapper behavior and swimming. With the aim of using this information to produce more effective bycatch reduction. In addition the project will evaluate a vortex generating bycatch reduction device to assess its ability to reduce capture of juvenile red snapper during shrimp trawl operations. **MARFIN Award NA17FF2031**

d. "Technology transfer of new turtle excluder device modifications and updated bycatch reduction device information to the southeastern shrimp fishery" - a one year, $171,000 project that will provide the shrimping industry with a clear description of new TED regulations and provide information on new BRDs as well as the status of prototype gears being tested. Meeting and workshops will be conducted from North Carolina through Texas, using Foundation specialists, to provide up to date information to shrimp fishermen, net shop owners, and other interested parties. **MARFIN Award NA17FF2867**

2. Reef fish fisheries

a. "Evaluation of the efficacy of current minimum size regulations for selected reef fish based on release mortality and fish physiology" - the first year of a two year, $359,804 project that will determine if red grouper are more susceptible to depth-induced mortality than red snapper, test whether smaller red grouper survive rapid decompression better than larger red grouper, and to obtain catch and release mortality rates for red grouper, red snapper, vermilion snapper, and mangrove snapper. The first two areas of investigation will center around the swim

bladder's size and structures such as the bundles of rete mirabile and the amount of gas gland cells. **MARFIN Award NA17FF2010**

c. "Estimating discard rate and release mortality of red snapper in Texas fisheries" - the first year of a three year, $354,244 project to estimate delayed release mortality of red snapper under controlled conditions and find physiological indicators of delayed release mortality using blood samples from caught fish. Using this information the project will also estimate the discard rate and delayed release mortality in commercial and recreational fisheries. In addition released red snapper will also be tagged to estimate recapture rate by the fisheries. **MARFIN Award NA17FF2012**

B. Reef Fish

1. Basic biological data

a. "Ecological factors limiting density and regulating growth and condition for gag grouper: A definitive test for the role of shelter" - the second year of a two year, $175,158 project to determine if reef habitat, specifically available shelter, limits local densities of gag grouper and thereby regulates the growth and condition of gag on the shallow continental shelf. Reef shelter will be manipulated in a field experiment involving intensive non-destructive sampling of experimental reefs. **MARFIN Award NA97FF0350**

b. "Validation of ages for species of the deepwater snapper/grouper complex off the coast of the southeastern United States" - the first year of a two year, $69,463 project to validate increment counts from otolith sections of tilefish, snowy grouper, blackbelly rosefish, blueline tile fish and wreakfish using accelerator mass spectrometry analysis of delta 14C present in otoliths. Validation of increment counts as a n estimate of age is critical if any age-structured management is used for a species. **MARFIN Award NA17FF2870**

c. "Red snapper *Lutjanus campechanus* in the northen Gulf of Mexico: Age and size composition of the commercial harvest and morality of regulatory discards" - the first of a three year, $298,016 project to obtain length and ages of red snapper randomly selected from the commercial fishery in the northern Gulf of Mexico which will allow the description of the size and age composition of the harvest. Observers on board commercial vessels will qualitatively assess release mortality of red snapper regulatory discards. **MARFIN Award NA17FF2007**

d. "The use of lipofuscin for aging Caribbean spiny lobster (*Panulirus argus*) - the first year of a two year, $115,281 project to make an accurate determination of the ages of lobsters from the Florida Keys and Dry Tortugas to develop a complete growth curve and age-length keys. Lobsters of known age will be used to calibrate the age-length keys. Knowledge gained on this species general growth parameters will be used in fisheries management. **MARFIN Award NA17FF2871**

2. Population assessment of reef fish

a. "Stock structure of red snapper in the northern Gulf of Mexico: Is their management as a single unit stock justified based on otolith microchemistry?" - the third year of a three year,

$187,356 project to determine the relative contributions of regional nursery areas to contemporary, offshore adult congregations, to determine long term movement and mixing rates of red snapper across the region, and to determine the nursery of origin of juvenile red snapper taken in shrimp trawls. Otolith microchemistry, as determined by inductively coupled - plasma mass spectrometry, will be used to link fish with nursery habitats. **MARFIN Award NA87FF0425**

b. "Stock structure of red snapper in the northern Gulf of Mexico: Is their management as a single unit stock justified based on genetic variation?" - the third year of a three year, $404,534 project to determine whether independent genetic subpopulations of red snapper exist in the northern Gulf, determine the number of breeders at different localities across the region and to determine whether changes in patterns of genetic variation and effective population size over decadenal time scales are consistent with the hypothesis that stock size has decreased significantly the last two to three decades. The project will also examine red snapper taken as shrimp bycatch to add a new dimension to assessment of the impact this fishery has on red snapper. **MARFIN Award NA87FF0426**

c. "Stock structure of red porgy, *Pagrus pagrus*, in the North Atlantic" - the first year of a three year, $280,092 project to determine stock identification in red porgy by examining variation in mtDNA and nuclear microsatellites. Samples will be taken in the South Atlantic Bight, which has been over-fished for red porgy, and in the Gulf of Mexico, where red porgy populations are in better condition. **MARFIN Award NA17FF2008**

d. "Stable isotopes as tracers of patterns in habitat utilization by juvenile red snapper" - a one year, $44,823 project that will use stable isotopic composition of red snapper tissues as chemical tracers of food web dynamics and dietary shifts. The project will examine juvenile red snapper collected over open sand bottom, low-relief shell rubble reefs, and artificial reefs to determine if the stable isotope composition (Carbon 13 and Nitrogen 15) differ among these habitats. **MARFIN Award NA17FF2875**

e. "Demographics, density, and seasonal movement patterns of reef fish in the northeastern Gulf of Mexico associated with marine reserves" - the first year of a two year, $373,531 project to characterize population parameters of all fisheries species associated with the Madison-Swanson and Steamboat Lumps Fishery Reserves on the eastern Gulf of Mexico shelf edge. Fish species demographics, density, and seasonal movements will be studied in the reserves and outside the reserves to allow for the comparison of fishing effects on these characteristics. **MARFIN Award NA17FF2876**

3. Management of reef fish

a. "Partitioning release mortality in the undersized red snapper bycatch: Comparison of depth vs. hooking effect" - the second year of a two year, $116,871 project to compare factors possibly leading to release mortality in red snapper. The project will use hyperbaric chambers to simulate field conditions in the lab to investigate the effects of rapid pressure changes on red snapper physiology. Red snapper caught aboard charter boats, head boats, and recreational vessels will be caught using circle and J hooks and tagged. Returns captures will be compared to determine hook mortality. **MARFIN Award NA97FF0349**

b. “Can Marine Protected Areas conserve genetic diversity in tomtate, *Haemulon aurolineatum*, and French grunt, *H. flavolineatum*?” - the first year of a three year, $281,889 project to assess the levels of genetic variation within and among populations of tomtate and French grunts using mitochondrial and nuclear DNA. This project will also evaluate the degree of population isolation in light of the requirements of current ecological models evaluating the impact of MPAs. **MARFIN Award NA17FF2878**

c. “An economic analysis of fleet dynamics in the Gulf of Mexico grouper fishery” - the first year of a two year, $208,980 project that will determine the active population of Gulf grouper vessels and analyze the factors determining gear choice decisions. The project will also identify the impacts of overall level of effort, fleet characteristics, and relevant regulatory and economic factors on the seasonal and spatial distribution of fishing effort targeting the Gulf grouper complex and analyze the impacts of alternative management policies on grouper harvests and production technology. **MARFIN Award NA17FF2879**

4. Evaluation of marine reserves as a fishery management tool

a. “Investigating movement patterns and spawning habitat of red hind grouper in a newly established Marine Fishery Reserve in the U.S. Virgin Islands” - the second year of a two year, $141,423 project to visually survey reef fish population structure and density of red hind grouper spawning aggregations. An intensive tag/release/recapture and sonic tagging program will also be undertaken to identify the source of groupers coming to the spawning sites. **MARFIN Award NA97FF0348**

b. “Marine Reserve effectiveness in restoring coastal food webs: An experimental test using the Special Protection Areas and an Ecological Reserve in the Florida Keys National Marine Sanctuary” - the first year of a two year, $183,578 project to examine the impacts of large piscivorus fishes on food web structure in and around coral reefs, the importance of linkages among seagrass and coral reefs in the re-establishment of these food webs, and the effects of habitat structure on the success of marine reserves. The project will take advantage of the rare opportunity to use replicated ‘no-take’ (predator rich) and unprotected (predator poor) reefs in the Florida Keys National Marine Sanctuary. **MARFIN Award NA17FF2015**

C. Red Snapper Research

1. Red snapper bycatch

a. “Geographic comparison of age, growth, reproduction, movement, and survival of red snapper off the state of Florida” - the first year of a three year,$623,161 project that will examine several factors affecting bycatch mortality. The project will specifically test whether circle hooks reduce release mortality in red snapper and the effects of depth and gear on release mortality. In addition the project will determine tag retention and obtain movement patterns for red snapper in the Gulf of Mexico and the southern U.S. Atlantic. **MARFIN Award NA17FF2881**

2. Red snapper biological information

a. "Assessment of bathymetric highs as nursery habitat of newly settled red snapper" - the first year of a three year, $211,469 project to couple active acoustic surveys with trawling data to provide fine scale resolution of habitat utilization by new recruits. The project will also combine estimates of growth and abundance to predict recruitment potential of juvenile fish from different bathymetric highs as well as different habitat types. **MARFIN Award NA17FF2872**

3. Red snapper population assessment

a. "Development of assays for major histocampatibility complex (MHC) Class I and Class II loci in Gulf red snapper for use in stock structure analysis and assessment of genetic health" - the first year of a two year, $68,700 project to develop PCR primers that optimize identification of orthologous from paralogous major histocompatibility complex genes in Gulf red snapper. The long term goal of the project is to use genetic tools developed in studies of stock structure and immune response capability to resist parasites, pathogens, and other cytotoxic challenges. **MARFIN Award NA17FF2880**

4. Management of red snapper

a. "Linking spatial-temporal population size structures and fishing effort dynamics to assess the effectiveness of minimum size for red snapper management" - the first year of a two year, $171,143 project to develop a state-of-the-art size-structures yield per recruit model for use in an assessment of the effectiveness of using minimum size as a viable red snapper management option. The project will provide regional and sub-regional perspective of exploitation impacts under minimum size framed by seasonal quota constraints. **MARFIN Award NA17FF2865**

b. "Bioeconomic analysis of the red snapper rebuilding plan and transferable rights policies in the Gulf of Mexico" - the first year of a two year, $122,319 project to modify the General Bioeconomic Fisheries Simulation Model to include five vessel classes that fish for red snapper. The model will be calibrated with the most recent data for shrimp, red snapper, and vermillion snapper and then analysis will be conducted on the proposed red snapper rebuilding plan alternative. **MARFIN Award NA17FF2873**

D. Coastal Migratory Pelagic Fisheries

a. "Renewal of an observer program to monitor the directed commercial shark fishery in the Gulf of Mexico and the South Atlantic" - a one year, $149,910 project to re-establish and expand a cooperative shark resource data collection system designed to enhance the reliability of management strategies for the shark fisheries in the southeastern U.S. This project will provide baseline characterization data on the species composition, relative abundance, and size composition within species for coastal shark species groups by depth and season in each regional fishery. **MARFIN Award NA97FF0041**

b. "Stock structure of dolphin, *Coryphaena hippurus*, in the western central Atlantic as determined by molecular genetic techniques" - the second year of a three year, $263,280 project to identify the stock structure of dolphin in the west central Atlantic using genetic analysis of

mitochondrial and nuclear DNA. The project will examine the genetic variation within and among populations of dolphin and will test the hypothesis that two distinct populations or stocks exist in the region. Mitochondrial DNA will be analyzed by restriction endonuclease digestion of the ND-1 region. Sampling will include northern and southern aggregations in the west central Atlantic. **MARFIN Award NA87FF0427**

c. "Discrimination among U.S. South Atlantic and Gulf of Mexico king mackerel stocks with otolith shape Analysis and otolith microchemistry" - the first year of a two year, $168,070 project to develop natural tags based on otolith microchemistry and shape analysis that will be used to estimate the relative contribution of each stock to the winter fishery off southeastern Florida and establish methods enabling annual estimation of stock mixing to facilitate more effective management of U.S. king mackerel stocks. **MARFIN Award NA17FF2013**

d. "Fishery and population characteristics of wahoo, *Acanthocybium solandri*, in Florida and adjacent waters of the western North Atlantic Ocean" - the first year of a three year, $182,701 project to summarize available fishery data for wahoo, complete a bag limit analysis, and synthesize new and published information about wahoo life history. Wahoo will be collected throughout the year from various fishing ports in Florida. Fish sizes will be related to sex and age and fecundity will be estimated from weighed sub-samples of oocytes in final maturation. **MARFIN Award NA17FF2882**

e. "Genetic analysis of wahoo, *Acanthocybium solandri*, stock structure in the western Atlantic and Gulf of Mexico by means of nuclear and mitochondrial DNA markers" - the first year of a two year, $165,276 project to resolve stock questions about wahoo utilizing seven demonstrated high resolution genetic makers. The direct results of this study will be a comprehensive genetic survey of wahoo encompassing its distribution and thereby provide one of the essential foundations for this species management. **MARFIN Award NA17FF2886**

E. Groundfish and Estuarine Fishes

a. "Identifying spawning grounds and classifying nursery habitat for red drum *Sciaenops ocellatus* in Pamlico Sound, NC " - the first year of a two year, $324,295 project to delineate spawning grounds in select regions in Pamlico Sound and classify nursery grounds by determining whether there are unique microchemical signatures in the otoliths of juvenile red drum captured in habitats fringing Pamlico Sound. The project will determine if adults exploit both the river mouth and tidal pass inlet habitats for spawning and examine the microchemical characteristics of the otoloith coreof young of the year red drum to identify the salinity of water at time of hatching. **MARFIN Award NA17FF2883**

b. "Red drum in South Carolina waters: The use of bottom longline gear to develop indices of relative abundance of adults in coastal and nearshore waters" - a one year, $75,679 project to use fishery independent longline sampling to develop catch per unit effort, size, sex, and age composition data and to tag adult red drum for the collection of migratory and stock identification data. The project will also tag and measure small sharks caught incidentally to red drum sampling for inclusion in the Cooperative Atlantic States Shark Pupping and Nursery Survey data base. **MARFIN Award NA17FF2884**

c. "Atlantic croaker, *Micropogonias undulatus*, along the middle Atlantic coast and southeast coast of the United States" - the first year of a three year, $223,732, project to obtain life history information, including abundance and distribution, on Atlantic croaker off the middle and south Atlantic states. The project will re-evaluate the interpretations of transverse sections of sagittal otoliths for age determination, calculate growth equations from size-at-age data, and generate cohort-specific indices of abundance. **MARFIN Award NA17FF2885**

F. Essential Fish Habitat

2. Develop scientific data to allow identification of EFH for Federally managed species

a. "Relationships between estuarine habitat structure and the spatial distribution and abundance of juvenile fishery species in Charlotte Harbor, Florida" - a one year, $41,153 project to identify relationships between distribution and abundance of selected fishery species and habitat structure on a estuary-wide basis. The project will create a GIS model to predict the abundance of juvenile fishery species over shallow portions of an estuary using identified associations with habitat structure and environmental variables. **MARFIN Award NA17FF2866**

4. Develop GIS mapping protocols to allow the presentation of EFH and HAPC

a . "GIS analysis of fishery-dependent data in relation to definition of essential fish habitat, habitat areas of particular concern, and marine protected areas in the South Atlantic Bight" - the first year of a two year, $193,786 project that will employ MARMAP fishery-independent trawl data to develop a GIS for the continental shelf and upper slope from Cape Hatteras, NC to West Palm Beach, FL. The GIS will examine historical and current databases for areas that might be considered Essential Fish Habitat, Habitat Areas of Particular Concern, and Marine Protected Areas. **MARFIN Award NA17FF2874**

G. General

a. "An integrated economic analysis of alternative bycatch, commercial, and recreational policies for the recovery of the Gulf of Mexico red snapper" - a one year, $88,589 project to conduct an economic analysis of alternative policies aimed at increasing red snapper stock levels in the Gulf of Mexico. The specific objectives include modifying the General Bioeconomic Fisheries Simulation Model (GBFSM) to include fractional license and fractional gear policies in the shrimp fishery, based on the GBFSM, developing a dynamic optimization model that incorporates a sustainability criterion, and estimating the increase in red snapper stocks associated with alternative fixed and flexible bycatch and red snapper policies. **MARFIN Award NA87FF0420**

b. "Intercept surveys of recreational spiny lobster fishermen in the Florida Keys" - a one year, $39,017 project to acquire information on the recreational spiny lobster fishery by conducting intercept interviews. The study will collect catch, effort, and demographic data that will be used to evaluate the accuracy of similar data generated by the Florida Fish and Wildlife Conservation Commission (FWC) mail surveys. Results from the intercept survey will aid the

FWC in developing management options for limiting the potential growth in this fishery. **MARFIN Award NA17FF2011**

c. "An intertemporal and spatially dynamic supply model of the Gulf of Mexico shrimp fleet for use in management and bycatch reduction" - the first year of a three year, $287,233 project to develop defensible parameter estimates that can assist in explaining changes in the behavior of shrimp fishermen in relation to economic stimuli and/or potential management measures. The changes in the behavior of shrimp fishermen in response to economic stimuli and management measures will first be derived using microeconomic and economic considerations. These parameter estimates will then be used to develop a joint production function that will allow the examination of expected changes in bycatch in relation to changes in behavior of shrimp fishermen due to changes in economic stimuli or management measures. **MARFIN Award NA17FF2868**

d. "Economic valuation of marine reserves in the Florida Keys as measured by diver attitudes and preferences: Implications for valuation of non-consumptive use of marine resources" - the first year of a two year, $87,723 project to determine the value of a non-consumptive activity, diving, on a marine reserve and to identify the factors that either enhance or reduce marine reserve value. The project will determine the monetary vale divers place on individual marine reserves in the Florida Keys and rank the attributes offered by the marine reserves that enhance diver visitation and satisfaction. **MARFIN Award NA17FF2869**

e. "Factors affecting participation in marine fisheries: case studies in Georgia and North Carolina" - the first year of a two year, $129,221 project to identify factors in two counties (McIntosh, GA, and Brunswick, NC) that have motivated commercial fishers to leave the industry and recreational fishers to begin fishing for sport and leisure. Interviews will conducted with a total of approximately 5,500 individuals during the two year project. **MARFIN Award NA17FF2877**

BIBLIOGRAPHY

(1) McIlwain, Thomas D. and Congressman Trent Lott. 1983. Research Needs for Information Leading To Full and Wise Use of Fishery Resources In the Gulf of Mexico. Discussion paper from the office of the Honorable Trent Lott.

(2) Christmas, J. Y., David J. Etzold, Thomas D. McIlwain and Larry Simpson, eds. 1985. Marine Fisheries Initiative: Gulf of Mexico Phase. Gulf States Marine Fisheries Commission Report 10.

(3) Joseph, Edwin B., David M. Cupka, Victor G. Burrell, Jr. and Peter J. Elridge. 1988. Marine Fisheries Initiative (MARFIN): South Atlantic Phase. Atlantic States Marine Fisheries Commission Special Report No. 13.

Appendix 1: MARFIN PANEL MEMBERS

Dr. Robert Stickney
Gulf of Mexico Sea Grant Representative
Texas Sea Grant College Program
2700 Earl Rudder Freeway South
College Station, TX 77845

Mr. Julius Collins
Gulf of Mexico Commercial Representative
163 Creekbend Drive
Brownsville, TX 78521

Mr. James Franks
Gulf of Mexico Recreational Representative
Gulf Coast Research Laboratory
703 East Beach Drive
Ocean Springs, MS 39566

Mr. Larry B. Simpson
Gulf States Marine Fisheries Commission Representative
Gulf States Marine Fisheries Commission
2404 Government Street
Ocean Springs, MS 39564

Mr. Wayne Swingle
Gulf of Mexico Fishery Management Council Representative
Gulf of Mexico Fishery Management Council
3018 U.S. Hwy. 301 N., Suite 1000
Tampa, FL 33619

Mr. William (Corky) S. Perret
Gulf States Representative
MS Department of Marine Resources
1141 Bayview Ave., Suite 101
Biloxi, MS 39530

Mr. Benjamin Hartig III
South Atlantic Commercial Representative
9277 SE Sharon Street
Hobe Sound, FL 33455

Appendix 1 (CON'T): MARFIN PANEL MEMBERS

Mr. Robert Mahood
South Atlantic Fisheries Management Council Representative
1 Southpark Circle
Suite 306
Charleston, SC 29407-4699

Dr. Louis Daniel
South Atlantic State Representative
NC Dept. of Environment, Health & Natural Resources
3441 Arendell Street
Morehead City, NC 28557

Dr. Lisa Kline Desfosse (Alternate)
Atlantic States Marine Fisheries Commission Representative
1444 Eye Street, N.W.
Sixth Floor
Washington, D. C. 20035

Dr. Mac Rawson
South Atlantic Sea Grant Representative
University of Georgia
Marine Science Building, Room 220
Athens, GA 30602

Mr. Wayne Lee
South Atlantic Recreational Representative
300 Raymond Avenue
Kil Devil Hills, NC 27948

Dr. Scott Nichols
NMFS Technical Representative
Laboratory Director
National Marine Fisheries Service
3209 Frederic Street
Pascagoula, MS 39567

Appendix 2: NMFS SOUTHEAST REGIONAL MARFIN ADMINISTRATIVE STAFF

Ellie Francisco Roche
Chief, State/Federal Liaison Office
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, FL 33702

Jeffrey E. Brown
Fisheries Grants Specialist
Fishery Biologist
State/Federal Liaison Office
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, FL 33702

Cynthia T. Binkley
Fisheries Grants Specialist
State/Federal Liaison Office
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, FL 33702

Scot B. Plank
Fisheries Grants Specialist
State/Federal Liaison Office
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersurg, FL 33702

Rita F. Daniels
Grants Assistant
State/Federal Liaison Office
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, FL 33702

Appendix 3: NMFS TECHNICAL MONITORS

Dr. Jose Castro	Miami Laboratory
Dr. Jean Cramer	Miami Laboratory
Ms. Nancie Cummins	Miami Laboratory
Mr. Douglas A. Devries	Panama City Laboratory
Dr. Pete Eldridge	Southeast Regional Office
Mr. Daniel Foster	Mississippi Laboratory
Mr. Gregg Gitschlag	Galveston Laboratory
Dr. Chris Gledhill	Mississippi Laboratory
Mr. Douglas E. Harper	Miami Laboratory
Dr. Stephen Holiman	Southeast Regional Office
Dr. Gene Huntsman	Beaufort Laboratory
Dr. Allyn G. Johnson	Panama City Laboratory
Dr. Dennis Lee	Miami Laboratory
Dr. John Merriner	Beaufort Laboratory
Dr. James Nance	Galveston Laboratory
Dr. Clay Porch	Panama City Laboratory
Dr. Allyn Powell	Beaufort Laboratory
Dr. Eric D. Prince	Miami Laboratory
Mr. William Richards	Miami Laboratory
Ms. Elizabeth Scott-Denton	Galveston Laboratory
Mr. Joseph W. Smith	Beaufort Laboratory
Mr. Mike Travis	Southeast Regional Office
Dr. Douglas S. Vaughan	Beaufort Laboratory
Dr. John Vondruska	Southeast Regional Office
Dr. James Waters	Beaufort Laboratory
Mr. John Watson	Mississippi Laboratory
Mr. Wayne N. Witzell	Miami Laboratory
Dr. Cheryl Woodley	Charleston Laboratory
Ms. Zoula Zein-Eldin	Galveston Laboratory
Dr. Roger Zimmerman	Galveston Laboratory

Appendix 4 - Federal Register Notice
Volume 66, Number 199
October 15, 2001

Appendix 5

MARFIN
Project
Summaries